

# An experiment to improve scientific communication skills amongst Norwegian students

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## Introduction

It is an unfortunate fact that many young Norwegian scientists are reluctant to aim high in the international scientific arena, and their ambition, if any, is to stay in the same 'home base' and hopefully get a permanent job there. Although many have excellent skills in English, they are understandably reluctant to use them and to join in international communication, both at the written and spoken levels.

To try to rectify this problem, and for other scientific reasons, the Quantitative Ecology and Palaeoecology Research Group (QEPRG) was created 15 years ago (1988) in the Former Botanical Institute of the University of Bergen. This lunch-time discussion group welcomed all those interested in quantitative aspects of modern ecology, palaeoecology, and systematics (<http://www.uib.no/bot/qeprg/index.htm>), with the aim of drawing together members of the Botanical Institute with mutual scientific interests. Its members (about 20) include professors, post-docs, doctoral students, and masters students, and a variety of visitors from other universities. Meetings every 2-3 weeks consist of news items (e.g. reports from conferences, scientific papers published, etc.) and one or two 20-minute presentations by all levels of the membership. Proposed research projects are presented, especially by doctoral and masters students, and are critically but informally discussed. Other presentations consist of progress reports on research, perhaps raising troublesome questions that can be discussed, nearly completed projects ready for inclusion in a doctoral or masters thesis, presentation of other pieces of completed research, or a lecture to be given or that has recently been given to another (international) audience about a research

project or a review. These are all discussed in an informal atmosphere. Having to present plans of a project or results makes a person have to think carefully and in an organised way, so that the research can be explained in a clear and understandable way. Discussion of the presentation is expected and is often very lively, and this stimulates the audience to listen critically and to logically consider their discussion points.

All the presentations and discussions are in English. The young Norwegians become accustomed to present and discuss science in English in a friendly atmosphere, and thus become trained to present lectures in an international context and to teach in English in today's international Bergen University. The international language of science is 'bad English'. All the more senior members have given international presentations, thus aiding their scientific careers, and several of them have worked for short periods outside Norway. In addition, there have been numerous non-Norwegian students and visitors, including 14 Marie-Curie Doctoral Fellows, in the group who cannot speak Norwegian.

Since the creation of one large Department of Biology in the University of Bergen in 2004, the QEPRG has ceased to officially exist. It has evolved into the Ecology and Environmental Change Research Group, which will continue to hold broad-based lunch-time discussions on the same principle as the QEPRG.

Has the QEPRG been successful in improving scientific communication and teaching? A questionnaire was given to 22 present and former QEPRG members, to seek their opinions on the value of hearing cross-disciplinary presentations, of presenting and discussing research projects and results, and of giving and discussing presentations in English.

## **The Questionnaire**

Replies were received from 16 people. Four of them have been members since the beginning, 7 have belonged for more than 10 years, and 5 have belonged from 2-9 years. Four people joined as post-docs or members of staff, 3 at the start of their doctoral studies, and the majority (9) joined at the start of their hovedfag or masters studies. All the hovedfag/masters students completed their theses and they all but one went on to do PhDs. A total of seventeen PhDs have been completed during the 15 years. Of these 12 obtained post-doc positions of which 6 now have permanent jobs in

an academic field. Four proceeded directly to permanent jobs. Of the younger members, one received the Meltzer Young Researcher Prize, one received the prize of the Royal Norwegian Research Society for his thesis, and one received a prize from the American Bryological Society for the best paper in their journal. Members of the group have published over 200 papers in international journals or books and presented a steady stream of lectures and posters at international conference (e.g. 14 in 2001). Their publications had received over 7000 citations by the end of 2003, according to the ISI data-base. This is a very high academic success rate and recruitment to a scientific career has been high. However, 3 outstandingly talented post-docs are still without permanent jobs, largely because of the scarcity of these in academic institutions at present.

Once the basic data had been obtained, the questionnaire split into questions for students and questions for post-docs and academic staff. Some of the more illuminating responses are given below.

### **Questions for students**

3. Give a short evaluation of your experience in giving short talks about your proposed project and/or results (including near the writing-up stage).

“Frightening”. “Really nervous”. (The automatic reaction!).

“It is great to have the opportunity to practice with a known audience before conferences and seminars, especially for PhD students.”

“I gained a lot.”

“Very useful, both to get used to giving presentations and to be forced to think about how to structure the work, how to present things to people that do not know what I am working with, to think about results before the work was completed, and get new ideas of interpretation of results or discuss interpretations that I felt were a bit weak.”

“My first talk was about my ‘hovedfag’ field-work. Giving the presentation (for people higher up in the hierarchy) was a very good experience, as well as discussing the project-design. Later presentations were also very fruitful, because it forced you to think more clearly about what you had done, the main results, interpretation, statistical analysis, etc. and people gave comments, suggestions, etc. This also applies to the work during my Ph.

“It was very useful to talk about my hivedfag thesis, which I did twice, mostly because of the rethinking and restructuring of the material that I had to do during the preparations.”

4. Was it useful for you to speak English (be honest!)?

“I was terrified at the beginning - but I do think it was useful.”

“I believe these presentations improved my English, which I think is very important. It is very hard (at least for me) to get the main point if someone speaks an almost impossible-to-understand English, because your focus is on what those strange words mean.”

“Yes it has been useful for me to speak in English, as the language of science is a kind of English. Using English has helped me improve my skills, and made me more relaxed about speaking at conferences.”

“Yes, because I write in English. And most of the literature is in English.”

5. Give a short evaluation of the experience you gained by discussing other people's presentations (in English).

“It is good practice to discuss other people's work/presentations. First it is the actual performance, technically (use of blackboard, overheads, if they walk back and forth on the floor, stand with their back to the audience, etc.). These are factors easy to see in other people that may make you think about what you are doing. Second, it is the actual discussion of the subject. I think it is very good experience to be forced to think about scientific areas that are marginal to what you are doing. However, if it is too far off, it can be a bit difficult to gain much.”

“In my opinion there are always more discussions when the talks have been on statistics. My statistical knowledge is not good enough to take part in those discussions, but I think it was nice that somebody had comments. In other fields I just didn't come up with any comments even though I have some knowledge in the field. But I got more out of listening to the discussion after such a talk.”

“I learned things that are important to remember in presentations and things that are not needed!”

6. Evaluate the usefulness of the group to you, e.g. in your work, in learning to discuss with colleagues, in taking criticism, et

“Very very important.”

“It is always useful to be part of a larger group. It makes one more confident in what you are doing. It is also easier to take criticism from people you know (does not actually feel like being criticised). It is useful also to learn and ‘get used to’ criticising and asking questions about other people’s work.”

“It links me to a number of people that I can approach if I need help or wonder about something.”

7. Was it useful to have colleagues from other fields and other countries in the group?

This received overall approval:

“Definitely very inspiring, and it is very important for young students/researchers to be involved in international activities.”

8. Was it interesting to hear ‘News Items’, short Conference Reports, receive reprints, etc.?

Unanimous “yes”.

9. Do you like the web page? Did you contribute to it?

Yes by all. (At least 10 people contributed material).

10. Any other comments or opinions?

“Some students might need a little bit more help in preparing the presentations, on how to structure the presentation and what to include.”

“I hope that the group (as the EECRG) will continue to meet regularly, but not too often, and that people will want to contribute.”

“I think it would be nice if more members from related fields are involved and take part in the discussion.”

“Keep up the good work. QEPRG is the best initiative in the department.”

## **Questions for post-docs and staff**

11. Give your opinion on the value of student presentations in English.

All replies were positive:

“It is of very great value as it helps prepare them for their defence and the international world of science.”

“It is valuable for every type of student to present their own work and to get feedback from others. For those who are planning a scientific career, it is especially valuable to practise their English.”

“The students are very lucky being ‘forced’ to present science to an audience at an early stage in their education.”

“I think it is useful to know what the students are working on.”

12. Evaluate the usefulness to you of giving short presentations about your work.

“This has been an enormous help when I later gave talks in English at larger conferences, etc.”

“Criticism on an informal level is always useful.”

“It is always useful to present one’s work:

Keeps the pace of progress when there is a deadline for presentation

Helps to summarise and synthesise the results

Helps to find key points of your work

Helps to discover major or minor weaknesses in your work

Helps to check if your numerical analyses are adequate”

“It is very important because I need (1) to practise giving talks and (2) to discuss my results with other researchers.”

13. Is it useful to listen to presentations in other (related) fields?

“The group allows me to gather experience in a wider field than my own particularities.”

“Yes, you have to concentrate and think of possible critical questions about the presentation. In addition, you may learn something new.”

“Very much so – one’s research benefits from learning from others.”

14. Is it valuable to you to discuss the presentations of others?

“The group leads to a broader view of problems and aspects of ecology for individuals.”

“Yes, it is valuable to discuss the presentations of others. This forces you to be an active listener who tries to get the rationale of the study, so as to have some critical or general comments; in contrast to just being there. The group could improve by getting more members involved in the discussions.”

“Certainly, both for yourself and for the person that gave the presentation.”

15. Evaluate the usefulness of the group as a teaching and research tool.

“Very very useful - see the success of QEPRG young scientists.”

“Increases skills, knowledge and interest.”

“Yes, it is extremely valuable to be able to ‘test’ an English presentation among some friends and colleagues before you present it at a workshop or conference. If there are good comments, the presentation will be more clear and to the point and within the scheduled time frame, which is sometimes difficult to see on your own.”

“Being able to join such a group is extremely important. The students and scientists have to be active and get immediate responses to their work. This is even more important than lectures!”

“Depending on what stage my project has been in, it is often very useful to give a talk to the group so that you have to really focus and try to understand and explain what the project is about! The comments received have also been very helpful in many cases!”

“The practice of talking about science is invaluable. The group is slightly more formal than a colloquium but still not too frightening (so the setting is right). It is a great forum to present one's ideas and get some feedback, perhaps we (meaning I) should use it even more in earlier stages of projects.”

“As a research tool it has repeatedly proven itself, and as a teaching tool I can only speak of my own experience, which is very positive.”

“It is beneficial to be able to ‘free float’ good ideas in the mutual trust and confidence within the group. It is an easy way to get comments on papers, presentations, proposals or other research ideas.”

16. Has being a member of the group helped you in your research and teaching, including international (e.g. conference) presentations?

Unanimous “yes”.

17. Do you like the web page? Did you contribute to it?

Unanimous approval of the web page.

#### 18. Any other comments?

“I think QEPRG included visitors to the institute in a good way and brought together people on many levels from students to well established researchers.”

“The research group would improve if it could find a way to increase the number of people who participate in the discussion (classical problem, though a bit extreme in Norway!).”

“In the future, the group will be enlarged as the EECRG. This would ensure that we had sufficient number of people at different levels present at all meetings and would hopefully enhance the theoretical/ecological focus and generality of the discussions. It would be great to sometimes discuss more general themes (e.g. use it more like a reading group) that are central to the ecological interests of the group. ‘What do we know about the effects of climate change on biotic systems, and what are fruitful paths to pursue in the near future?’ could be one such theme. Perhaps this could facilitate the development of future research projects.”

“I really hope this group will survive and perhaps expand in the new Department of Biology I have had a great advantage by being linked with this group. A strong element of the group is the combined diversity of interest, i.e. many have similar scientific interests but attack it from slightly different angles. This makes the group suitable for the future at the new Department, and it may be time to expand. However, we are in a position to say in which direction we want the group to move. This is important as the new director of the Department has clearly signalled an emphasis on research

“I consider the QEPRG and the effects it has had on young Norwegian scientists to be one of our real contributions to Bergen biological sciences. It is a real success story.”

### **Conclusions**

The responses to the questionnaire were all very positive and constructive and illustrate that both students and more senior researchers appreciate belonging to the group. It seems to be clear that all levels of membership have benefitted and have gained in scientific confidence. The youngest, most immature hovedfag students have learned quickly and many of them, a few years later, are now respected young scientists with international reputations.

Norwegian students frequently lack the confidence to present and discuss their science to an audience, even in Norwegian. They never get any experience of doing this as undergraduates until, in 2003/4, new ‘Quality Reform’ courses were



introduced. This state of mind is certainly not unique to Norwegian students, but it is characteristic of them. The QEPRG has given them the chance to remedy this. They all appreciate how, having to give a talk, they have to think about how to present their projects in a clear and organised way to others who do not know about their work, and then to be able to respond to questions and discussion. Many have gone back and modified their research questions and approach as a result. As a consequence, they are able to write better theses and present and defend them at a high level. The more senior researchers also comment on how valuable it is to give a talk about their research, maybe to gain new insights into a project or to practise a forthcoming international presentation.

The requirement that the group meetings be conducted in English was an entirely new concept at the beginning, but it was a challenge that most members readily accepted. They realised that English is the language of international science. Volunteers to give talks to the group were sparse to begin with, but soon there were almost too many volunteers to fit into the programme. As a result, the spoken English skills of the members have noticeably improved, and this is reflected in their written English too. Now people are unafraid to write an article in English, knowing that grammatical mistakes are unimportant to the science and are easily corrected by an expert later.

This new confidence has stimulated the young researchers to play a full role in the international research scene. They can organise their research into relevant questions, discussion, and conclusions, and they know they have the group as a back-up against which to test ideas and presentations. Consequently, they have not been afraid to aim high, both in giving lectures at international conferences and in submitting papers and getting them published in the most respected international journals, including 'Nature' and Science'. They are enthusiastic about their research projects, encouraged by interaction within the group, and are eager to present their results to international audiences.

The QEPRG has had additional effects on its members. They have learned about what other members have been doing, and thus have got to know each other scientifically as well as socially. This has resulted in cross-fertilization of ideas and many instances of collaboration in new research projects, thus forming a stimulating research environment. These collaborations have often continued even after the individuals have moved away to new jobs. In addition, visitors to the group have often

been stimulated to collaborate in new projects and the Marie Curie Doctoral Fellows have added a new dimension to the scientific diversity at the student level.

The QEPRG has now (2004) evolved into the EECRG, with the inclusion of zoologists and microbiologists, thus creating a broader-based group, so it is appropriate to evaluate the success and contribution of the QEPRG to Norwegian botany students at this point. There is no doubt that the experiment of the QEPRG has been a great success and a large influence on the scientific development of these students over the last 15 years. Their scientific communication skills have been greatly improved, and they now have the confidence to become international scientists. It is hoped and expected that the EECRG will be equally successful as it continues the QEPRG tradition.